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Press release

## Future therapies for cardiovascular diseases

Rome, 19 February 2015 – The therapies of the future for cardiovascular diseases are the central theme of the **Symposium entitled “New trends in cardiovascular therapy”, held in Rome from 19 to 21 February 2015 and sponsored by the Fondazione Internazionale Menarini.** The treatments for atrial fibrillation, ischaemia, angina, and heart failure are now able to help reduce cardiovascular risk and the risk factors, including high cholesterol levels and blood pressure.

- Diabetes, hyperlipidaemia (increased plasma concentrations of cholesterol and triglycerides), hypertension, cigarette smoking are the major causes of oxidation of the LDL cholesterol. An alteration that generates a chain reaction leading to inflammation of the blood vessels followed by the formation of arteriosclerotic plaques, with the risk of cardiovascular events such as infarction and stroke. The mechanism which makes the LDL cholesterol one of the triggering factors of cardiovascular diseases is among the main issues of “Diabetes, hyperlipidaemia, hypertension, and cigarette smoking alter the LDL and induce a sort of *oxidative stress* for the endothelial cells” confirms **Francesco Romeo, Director and Chair of Cardiology at the Tor Vergata University of Rome and President of the Italian Cardiology Society.** “The endothelium is the tissue covering the internal surfaces of the blood vessels. It is structurally simple but functionally complex; it is capable of secreting substances, modulating the vascular tone, and helping to maintain the antithrombotic properties of the vessel by regulating the coagulation, fibrinolysis (the process via which the fibrin, in the form of a blood clot or thrombus, is broken down into soluble products) and the platelet aggregation; it acts as a barrier against the indiscriminate passage of blood constituents inside the arterial wall; and it controls the proliferation of the smooth muscles cells. Numerous studies have demonstrated that after accumulating inside the arterial wall, the oxidated LDL plays a crucial role in damaging the endothelium, causing the aggregation of platelets and the formation of thrombi. The experts gathered in Rome therefore expressed the hope that in the future one of the research issues in the field of arteriosclerosis will be precisely the oxidative stress faced by LDL during the ageing process, but also caused by habits and lifestyles, such as diet and cigarettes smoking.

- As regards the therapies, **Antonio Aversa, lecturer of endocrinology at the La Sapienza University of Rome,** points out how unknown substances, or those judged as harmful, like gases and oxides, are instead at the basis of effective drugs against cardiovascular diseases, such as nitroglycerin, or the vasodilators, such as those for combating erectile dysfunction. This is the case of nitric oxide and hydrogen sulphide. “Nitric oxide and hydrogen sulphide are involved in numerous cardiovascular diseases since the alteration of their secretion, both in excess and defect, can either give

rise to pathological effects or be beneficial”, explains Aversa. “In particular, nitric oxide is the mediator on which the activity of numerous drugs used in the cardiovascular sector is based, among which the most well-known are probably the nitroderivates, like nitroglycerin, and among the Beta-blockers, Nebivolol, all of which are used extensively”. The nitric oxide synthesis is stimulated by various factors like the so-called "shear stress", a parameter for measuring the force exerted by the blood flow against the vessel walls. “When there is an excessive rise in blood pressure, the body defends itself by synthesising nitric oxide which, by dilating the vessel walls, helps lower the pressure”. By exploiting this mechanism, researchers have been able to use the effects of nitric acid on the circulatory system in order to create drugs against the erectile dysfunction, including Sildenafil, Avanafil and others.

- Another session of the Symposium addressed the role of uric acid in various diseases. Besides being responsible for gout, the most common form of arthritis in adults, hyperuricaemia also intervenes in cardiovascular diseases and diabetes.

“The average rate of uricaemia is progressively increasing in the western world; in the male population in the United States, the value has doubled in only a few decades. The recent gradual rise in uricaemia is attributed to the growing prevalence of obesity and an increase in consumption of foods that favour the increment of uric acid in the blood”, explains **Maurizio Volterrani, Director of the Cardiologic Rehabilitation Department of the IRCCS San Raffaele Pisana in Rome**. “Today the availability of therapies such as Febuxostat that are better tolerated and more effective in reducing the levels of uric acid in the blood than the previously-used allopurinol, allows for reducing the risk of correlated cardiovascular diseases”.

- “Atrial fibrillation is the cause of 15% of all cardioembolic strokes. This means that, out of the two thousand cases a year in Italy, 30,000 are caused by this frequent anomaly of the heart rhythm. Recently however, a new class of drugs has also become available in Italy, the new, more user-friendly and safer oral anticoagulants that are capable of meeting the needs of physicians and patients alike. This is a great step forwards for cardiologists and patients, but it is also important not to forget to reinforce the physician-patient relationship on the basis of the new method of preventing the thromboembolic risk”, points out **Pasquale Perrone Filardi, Director of the U.O.S. of Myocardium diseases and Pulmonary Arterial Hypertension of the Federico II University Hospital of Naples**.

- As far as ischaemic events are concerned, the experts who met in Rome addressed the various intervention options. “Even though the data available in literature limit the effectiveness of interventional therapy in acute myocardial infarction to the very first hours after the onset of symptoms, an ever-increasing number of patients are transferred to haemodynamics in order to receive primary angioplasty in unpredictable precoronary times which, in many cases, denies the patient the chance to receive prompt treatment with thrombolytics”, warns **Giuseppe Rosano, Director of the Cardiology Department of the IRCCS San Raffaele Pisana in Rome**. “Recent data have demonstrated how the clinical choice is extremely important in managing the patient with acute ischaemic syndromes”.

The results of a recent study have shown that while the two treatments are equally effective in reducing the cardiovascular mortality, the aggressive interventional treatment significantly increases the number of cases of myocardial infarction (14.6% against 9.4% of patients initially treated pharmacologically), thus suggesting that the referring of patients with acute coronary syndromes to a haemodynamic department must be based on clinical characteristics and not be guided by the stereotypical classification of the acute coronary syndrome, clearly indicating that more in-depth analyses are necessary in an attempt to identify more specific management protocols capable of optimising the results and costs depending on the clinical conditions of subjects with acute coronary syndromes”.

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